

125 WATT BAND II VHF FM POWER AMPLIFIER



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1. INTRODUCTION



The equipment when connected and used as described in this document, is subject to geographic restrictions and licensing from the radio spectrum regulator in the EU Member State.

Please read this manual before assembling and starting the unit.

This will ensure that the product operates as intended.

1.1 Unpacking and Control

Please make sure the product is complete and it has not been damaged during transport.

In the case of any damage please contact us at info@aareff.com

1.2 General Information

This manual does not contain any kind of warranty. The terms of warranty are in our general conditions of sale.

This product should only be installed and serviced by suitably qualified personnel.

If any difficulties arise during the installation or commissioning, please seek assistance at the official website. www.aareff.com.

1.3 User Safety Responsibility

You are responsible for selecting the correct equipment appropriate for your application, installing it properly and ensuring the maintenance of all the components.



This symbol appears in the manual to call attention to instructions concerning the safety of the installation, operation and use of the product.

1.4 Electromagnetic Compatibility

This product complies with EMC directive EN 301 489 – 11 of the European Union. To meet this directive you must follow the wiring instructions

1.5 Intended Use

This equipment is intended for use as a RF power amplifier and should only be connected to a suitable driver transmitter and a suitable antenna that ideally presents 50 ohm load (SWR < 1.4 16dB return loss) at the operating frequency.

This equipment is intended for use permanently at a pre-defined location with a license or authorisation from the radio spectrum regulator of the EU member state.

This equipment is not intended for installation by an unqualified end user, the installer must have competent RF engineering skills and EMC knowledge at their disposal. The whole transmission system, including the antenna system and external audio limiting, should be installed in accordance with document ETR132, a copy of this is available at <http://www.aareff.com/ETR132.pdf>

2. PACKAGE CONTENTS

Quantity	Description
1	19 Inch Rack Mount 125 Watt Amplifier
1	Mains AC Cord With IEC Type Connector
1	Short 50 Ohm RG58 Cable Terminated With BNC Connectors

3. PRE-INSTALLATION

3.1 Amplifier Driver / Exciter



The Driver / Exciter needs to be compliant and set to the correct frequency BEFORE the amplifier is powered by AC Mains

Under NO CIRCUMSTANCES should the amplifier be connected to a Driver / Exciter where the RF output performance and specification is unknown. Such action could cause serious disturbance to the electromagnetic spectrum and in extreme cases dangerous interference to air navigation and emergency services.

The amplifier requires a suitable driver / exciter with audio limiting and an RF output of between 900mW and 1400mW (MAX) when loaded with 50 ohms. This must also be equivalent, better or meet the specifications shown in European Standard ETS 300 384.

Before powering up the amplifier the frequency of the Driver / Exciter should be set and checked. If the AC mains is not connected to the power amplifier, it is safe to use the power amplifier BNC input as a dummy load for the Driver / Exciter. At this stage, if possible, it would also be advisable to check the deviation and that the audio of the Driver / Exciter is correct.

If you are using a transmitter driver supplied by another manufacturer, compliance cannot be guaranteed. On completion of the installation it is necessary that the engineer checks the RF output of the power amplifier for compliance.

3.2 Antenna



Incorrect Antenna can cause RF burns and levels of RF Exposure above the recommended limits for personnel

Under NO CIRCUMSTANCES should the antenna be mounted and used at ground level or within a few meters of personnel.

A tuned antenna with the 50 ohm coaxial cable should be used. This should give a return loss ideally of 16dB (SWR 1.4) or better at the operating frequency. The RF plug should be PL259 (UHF) or N type, depending which is fitted to the power amplifier.

Ensure that all antenna connections are sound, this is important as poor connections and soldered joints can cause RF burns to personnel, severe noise to the transmission and excessive RF bandwidth.

Ideally the antenna for this power amplifier should be at least 2 dipoles stacked and phased, a 5/8 type or other antenna with similar gain or more to the horizon. It should be ideally mounted 20 meters high and clear of any surrounding objects to get maximum range and more importantly to reduce risk of radio frequency radiation to personnel. When mounted at 20 meters in height off ground and using 250 watts of transmitter power, power flux density measurements made at ground level directly under the antennas described above show less than 1 W/m². Several European countries use a value for the power flux density of 10 W/m² as a basis for considering whether or not an area is safe. The issue of radio frequency radiation limits is a contentious one and work in this field is continuing worldwide.

4. INSTALLATION

4.1 Pre-Installation

The previous section, PRE-INSTALLTION is very important, check this has been done. It is self explanatory from the rear panel where the power supply plugs in, DO NOT plug in the power supply at this stage.

4.2 Antenna Connection

Plug the antenna cable into the amplifier large SO239 or N type connector. Make sure this tight as poor and loose connections can cause RF burns to personnel, severe noise to the transmission and excessive RF bandwidth.

4.3 Driver / Exciter Connection

Plug the 1W drive into the small BNC connector. DO NOT USE MORE THAN 1.4W or it will damage the input stage.

4.4 Power Supply Connections

Plug in power supply to mains and power up driver transmitter.

5. OPERATION

5.1 Normal Conditions

You should hear the cooling fan. The fan draws air into the front and exits the warm air through the rear vents. It is important to keep these vents clear. If you cannot hear the fan turning, then shut the amplifier down by removing the AC mains immediately.

The front meter should illuminate in BLUE

5.2 FWD and REF Switch

The front panel meter should show 125W or more when the switch is selected to FWD. This is power being sent out of the output socket to the antenna.

When REF is selected the power reading ideally should be less than 10W, this means that only 10W or less is being reflected back from the antenna, this is an acceptable and a normal amount. If the power reading is higher than 20W the antenna may need tuning or there may be a problem with the antenna feeder cable or plugs. If the reading is higher than 30W then there is a serious problem with the antenna and you should shut down the power amplifier and investigate the antenna cables, connectors and installation for problems.

5.3 Power Control

It is possible to reduce the power by reducing the Driver / Exciter if 125W is too much for your application. If you cannot reduce the power of the Driver / Exciter then there is a power control inside the amplifier. If you need to use this, please contact us for advice.

6. MAINTENANCE

The only maintenance the amplifier needs is some periodic cleaning. Following a number of weeks of continuous 24/7 use (specified below), the amplifier should be shut down and disconnected. A technician or engineer needs to take off the top lid by removing the 6 self-tapping screws, 2 on the top edge on each side and 2 on the top edge at the back. Using a soft new and clean paint brush with a vacuum clean hose the dust should be gently brushed and sucked away from all areas inside. Pay particular attention to the actual fans at the rear and the fan vents at front and rear.

The number of weeks when cleaning should be done.

4 weeks in very dusty, sandy and salty environments for installations near to the sea.

6 weeks in very dusty and sandy environments.

8 weeks in very dusty environments, public areas, office blocks etc.

12 weeks in generally clean environments.



Do not adjust any factory set internal controls

Under NO CIRCUMSTANCES should any adjustments be made to the internal controls. Such adjustments could damage the unit and invalidate the warranty and also cause serious interference to other users of the electromagnetic spectrum.

7. LEGAL ADVICE

We sell this equipment to professionals and organizations in good faith it will be used correctly and legally. Most countries in the world require licensing for this type of equipment. It is the customer's responsibility to check relevant laws, directives, regulations and licensing requirements before putting this product into service with an antenna system. You, the customer or user agree to defend, indemnify and hold harmless Aareff Systems Limited, its employees and agents, from and against any claims, actions or demands, including without limitation legal and accounting fees, alleging or resulting from improper or unlawful use of this equipment.

8. TECHNICAL DATA

8.1 RF Parameters

Power Input	1 Watt MAX. into 50 ohms
Power Output	Adj. 20-125 Watts into 50 ohms
Freq Range	87.5 to 108 MHz
Spurious Emissions	Less than -75 dB ref to carrier
Harmonic Emissions	Less than -70 dB ref to carrier
Residual AM	Less than 0.5%
Synchronous AM	Less than 0.5%
RF Ruggedness	Any VSWR, phase, length of time
Output Connector	SO239 (or optional N type)
Input Connector	BNC 50 ohms
Operating Temp	-20 to +40 Deg C

8.1 AC Mains Parameters

Input Voltage	88~264VAC 47-63 Hz 124~370VDC
Input Power	380-440W for 125W RF OUT with RF SWR < 1.5
Power Factor	PF>0.95/230VAC PF>0.98/115VAC at full load
Working Humidity	20 ~ 90% RH non-condensing
Safety Standards	UL60950-1, TUV EN60950-1 Approved
EMC Conduction & Radiation	Compliance to EN55022 (CISPR22) Class B
EMC Harmonic Current	Compliance to EN61000-3-2,-3
EMC Immunity	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, Light industry level, criteria A

9. EQUIPMENT COMPLIANCE

Aareff can only guarantee compliance with;

- ETS 300384 European Telecommunications Harmonised Standard when used with:
 - i. A transmitter driver supplied and tested by Aareff.
 - ii. An audio compressor limiter supplied and tested by Aareff.

- EN 301489-11 V1.3.1 (2006-05) EMC Electromagnetic Compatibility when used with 1 meter mains lead supplied and the 1 meter BNC-BNC RG58 lead supplied. If the installation engineer needs to extend the leads, both leads should be no more than 3 meters in length to remain in compliance with EMC directive.

Equipment compliance is possible using equipment from and in conjunction from other manufacturers, but since this is beyond the control of Aareff Systems, Aareff Systems cannot or be expected to guarantee compliance.

DECLARATION OF CONFORMITY

AAREFF SYSTEMS LIMITED (UK)
Company No 7140572

We hereby declare that the following product;

AAREFF 19 INCH RACK 125 WATT FM
BAND II VHF POWER AMPLIFIER (125WNTAP)

Is in compliance with the following standards where applicable:

ETS 300 384/A1 ed.1 (1997-02)

Radio broadcasting systems Very High Frequency (VHF) frequency modulated sound broadcasting transmitters only when used in conjunction with an ETS 300 384 compliant Driver / Exciter and Audio Limiting equipment

EN 301 489-11 V1.3.1 (2006-05)

EMC Electromagnetic Compatibility

2006/95/EC Directive (2006-12)

LVD Low Voltage Directive.



Every care has been taken in the preparation of this document, errors in content, typographical or otherwise, may have occurred. If you have comments concerning its accuracy, please contact Aareff Systems Limited (UK)

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